

CLAIMS

1. A rolling bearing including a race and a rolling element,
at least one member of said race and said rolling element having a nitrogen-

5 enriched layer in its surface layer, a surface layer portion containing austenite crystal grains having a grain size number of at least 11, and a steel forming the member having a position exhibiting HRC50 in a hardenability test (JISG0561) apart from a quenched end by a distance of at least 12.7 mm (8/16 inch).

10 2. A rolling bearing including a race and a rolling element,
at least one member of said race and said rolling element being formed of a steel containing 0.8-1.5 wt% of carbon, 0.4-1.2 wt% of Si, 0.8-1.5 wt% of Mn, and 0.5-1.8 wt% of Cr, and having a nitrogen-enriched layer in its surface layer, and a surface layer portion containing austenite crystal grains having a grain size number of at least 11.

15 3. The rolling bearing according to claim 2, wherein a concentration of nitrogen of said surface layer is 0.05-0.7wt%.

20 4. The rolling bearing according to claim 2, wherein a value of specific surface area represented as (a surface area/ a volume) of said at least one member is not more than 0.6.

25 5. A heat treatment method for steel, comprising the steps of: carbonitriding or nitriding at 810-950°C a part formed of a steel containing 0.8-1.5 wt% of carbon, 0.4-1.2 wt% of Si, 0.8-1.5 wt% of Mn, and 0.5-1.8 wt% of Cr, the steel having a position exhibiting HRC50 in a hardenability test (JISG0561) apart from a quenched end by at least 12.7 mm; subsequently cooling the part to a temperature range lower than a transformation point A1 of said steel; and subsequently heating the part again to a

quenching temperature range not lower than the transformation point A1 and lower than a temperature used for said carbonitriding or nitriding, to quench the part.

6. The heat treatment method for steel according to claim 5, wherein the
5 quenching temperature range not lower than said transformation point A1 and lower than the temperature used for said carbonitriding or nitriding is 750-810°C.